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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,931	12/17/2003	Dirk Verdyck	HEGN02145	8481

29127 7590 02/26/2007

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EXAMINER	
THANGAVELU, KANDASAMY	
ART UNIT	PAPER NUMBER
2123	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/738,931	VERDYCK, DIRK
	Examiner	Art Unit
	Kandasamy Thangavelu	2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/17/2003*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-23 of the application have been examined.

Information Disclosure Statement

2. Acknowledgment is made of the information disclosure statements filed on December 17, 2003 together with a list of the patents. The patents have been considered.

Drawings

3. The drawings submitted on December 17, 2003 are accepted.

Claim Objections

4. The following is a quotation of 37 C.F.R § 1.75 (d)(1):

> The claim or claims must conform to the invention as set forth in the remainder of the specification and terms and phrases in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

5. Claims 1 and 10 are objected to because of the following informalities:

Claim 1, Line 12, "the graphical output (d_n) in function of" appears to be incorrect and it appears that it should be "the graphical output (d_n) as a function of".

Claim 1, Line 17, "the graphical output (d_n) in function of" appears to be incorrect and it appears that it should be "the graphical output (d_n) as a function of".

Claim 10, Page 48, Line 1, "the graphical output (d_n) in function of" appears to be incorrect and it appears that it should be "the graphical output (d_n) as a function of".

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10, Line 2 states, "a thermal printer having the thermal print head (2) ". There is insufficient antecedent basis for "the thermal print head" in the claim.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

9. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Verdyck** (U.S. Patent Application 2002/0136582) in view of **Tainer et al.** (U.S. Patent Application 2004/0179051).

10.1 **Verdyck** teaches Method for thermal printing. Specifically, as per Claim 1, **Verdyck** teaches a method for generating a mathematical model of thermal printing characteristics of a thermal printing system using a computing device (Abstract, L1-20 and 16-20; Page 4, Para 0083 and Para 0084; Page 5, Para 0110), the thermal printing system comprising a thermal printer having a thermal head (2) incorporating a plurality of energisable heater elements (4) and a heat sink (24), and a thermographic material (10) (Abstract, L1-4; Page 2, Para 0017, L1-6), said method comprising:

- making a reference printout, on the thermographic material (10), the reference printout consisting of several printed regions with each of the several printed regions being printed with a different amount of heat energy (E_n) delivered to the heater elements (4) (Page 2, Para 0023; Page 4, Para 0084; Page 4, Para 0099; Page 5, Para 0110).

Verdyck does not expressly teach method for generating a mathematical model of thermal steady state printing characteristics of a thermal printing system using a computing device; and making a reference printout, on the thermographic material (10), the reference printout consisting of several printed regions with each of the several printed regions being printed with a different steady state amount of heat energy (E_n) delivered to the heater elements (4). **Tainer et al.** teaches method for generating a mathematical model of thermal steady state printing characteristics of a thermal printing system using a computing device; and making a reference printout, on the thermographic material (10), the reference printout consisting of several printed regions with each of the several printed regions being printed with a different steady state amount of heat energy (E_n) delivered to the heater elements (4) (Page 1, Para 0012, L1-3; Page 18, Para 0176). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Verdyck** with the method of **Tainer et al.** that included making a reference printout, on the thermographic material (10), the reference printout consisting of several printed regions with each of the several printed regions being printed with a different steady state amount of heat energy (E_n) delivered to the heater elements (4), because that would achieve high image quality with a thermal printer using compensation for the thermal storage elements in the printing system (Page 1, Para 0012, L1-3); and the

compensation for the artifacts would not change net printing density in the steady state (Page 18, Para 0176, L1-3).

Verdyck teaches determining a measure of the graphical output (d_n) in function of at least a parameter for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed (Page 2, Para 0023; Page 5, Para 0117-Para 0123). **Verdyck** does not expressly teach determining a measure of the graphical output (d_n) in function of at least a parameter relating to the heat sink temperature for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed in a thermal steady state. **Tainer et al.** teaches determining a measure of the graphical output (d_n) in function of at least a parameter relating to the heat sink temperature (Page 15, Para 0145; Page 16, Para 0158, L8-10), for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed in a thermal steady state (Page 1, Para 0012, L1-3; Page 18, Para 0176).

Verdyck teaches determining establishing the mathematical model by determining a best fit relationship between the measures of the graphical output (d_n) in function of at least the parameter (Page 4, Para 0084; Page 5, Para 0110; Page 2, Para 0017). **Verdyck** does not expressly teach establishing the mathematical model by determining a best fit relationship between the measures of the graphical output (d_n) in function of at least the parameter related to the heat sink temperature and the steady state amounts of heat energy (E_n). **Tainer et al.** teaches establishing the mathematical model by determining a best fit relationship between the measures of the graphical output (d_n) in function of at least the parameter related to the heat sink

temperature (Page 15, Para 0145; Page 16, Para 0158, L8-10) and the steady state amounts of heat energy (E_n) (Page 1, Para 0012, L1-3; Page 18, Para 0176).

Per Claim 2: **Verdyck** and **Tainer et al.** teach the method according to claim 1. **Verdyck** teaches that the heat energy is represented by a given equivalent time (t_{exc},) used for powering the heater element (4) with an equivalent constant power (P_0), E_n=t_{exc}*P_0 (Page 4, Para 0096; Page 7, Para 0139 and Para 0142).

Per Claim 3: **Verdyck** and **Tainer et al.** teach the method according to claim 1. **Verdyck** teaches while making the reference printout, logging of parameters (P_j) that are determinative to the graphical output (d_n) (Page 4, Para 0083; Page 5, Para 0110).

Per Claim 4: **Verdyck** and **Tainer et al.** teach the method according to claim 1. **Verdyck** teaches establishing a table (T) of data comprising the steady state graphical output function (d_n), and the used energy (E_n or t_{exc}), giving an implicit relationship between the graphical output function (d_n) and its controlling parameters (E_n, or t_{exc}) (Page 4, Para 0083; Page 5, Para 0110).

Per Claim 5: **Verdyck** and **Tainer et al.** teach the method according to claim 4. **Verdyck** teaches the parameters (P_n) that are determinative to the graphical output (d_n) (Page 4, Para 0083; Page 5, Para 0110).

Per Claim 6: **Verdyck** and **Tainer et al.** teach the method according to claim 4. **Verdyck** teaches that the best fit relationship is a parametrisable function (f()), being defined by a set of unknown coefficients (a,b,c,d,...) found using a curve fitting process on the table (T) (Page 5, Para 0106 to Para 0109).

Per Claim 7: **Verdyck** and **Tainer et al.** teach the method according to claim 1. **Verdyck** teaches that a printing pattern of the reference printout is selected so that the pixels being printed do not interact with each other (Page 11, Para 0226).

10.2 As per Claim 9, **Verdyck** and **Tainer et al.** teach the method according to claim 1. **Verdyck** does not expressly teach that the graphical output (d_n) is a pixel with a certain colour spectral density in the centre of the pixel and/or a pixel with a certain size defined by a perimeter having a given colour spectral density, to be reproduced on the thermographic material (10). **Tainer et al.** teaches that the graphical output (d_n) is a pixel with a certain colour spectral density in the centre of the pixel and/or a pixel with a certain size defined by a perimeter having a given colour spectral density, to be reproduced on the thermographic material (10) (Page 27, Para 0317 to Para 322).

10.3 As per Claim 10, **Verdyck** teaches a method for driving a thermal print head of a thermal printing system (Page 1, Para 0010, L1-8), comprising a thermal printer having a thermal head

(2) incorporating a plurality of energisable heater elements (4) and a heat sink (24), and a thermographic material (10) (Abstract, L1-4; Page 2, Para 0017, L1-6), the method comprising:

- making a reference printout, on the thermographic material (10), the reference printout consisting of several printed regions with each of the several printed regions being printed with a different constant amount of heat energy (E_n) delivered to the heater elements (4) (Page 2, Para 0023; Page 4, Para 0084; Page 4, Para 0099; Page 5, Para 0110; Page 7, Para 0139);

establishing the mathematical model by determining a best fit relationship between the measures of the graphical output (d_n) and the constant amounts of heat energy (Page 4, Para 0084; Page 5, Para 0110; Page 2, Para 0017); and,

in a second mode: -

determining a heat energy to be supplied to at least one energisable heater element (4) in accordance with the mathematical model for printing of an image on a thermographic material (10) using a thermal printing system (Page 5, Para 0117 to Para 0123) comprising a thermal printer having a thermal print head (2) incorporating a plurality of energisable heater elements (4) and a heat sink (24) (Abstract, L1-4; Page 2, Para 0017, L1-6).

Verdyck teaches determining a measure of the graphical output (d_n) in function of at least a parameter for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed (Page 2, Para 0023; Page 5, Para 0117-Para 0123). **Verdyck** does not expressly teach determining a measure of the graphical output (d_n) in function of at least a parameter relating to the heat sink temperature for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed in a thermal steady state. **Tainer et al.** teaches determining a measure of the graphical output (d_n) in function

of at least a parameter relating to the heat sink temperature (Page 15, Para 0145; Page 16, Para 0158, L8-10), for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed in a thermal steady state (Page 1, Para 0012, L1-3; Page 18, Para 0176).

Verdyck does not expressly teach determining a heat energy to be supplied to at least one energisable heater element (4) in accordance with a current value of the parameter related to the heat sink temperature. **Tainer et al.** teaches determining a heat energy to be supplied to at least one energisable heater element (4) in accordance with a current value of the parameter related to the heat sink temperature (Page 15, Para 0145; Page 16, Para 0158, L8-10).

10.4 As per Claims 11-16 and 18, these are rejected based on the same reasoning as Claims 2-7 and 9, <u>supra.</u> Claims 11-16 and 18 are method claims having the same limitations as Claims 2-7 and 9, except they depend on claim 10. Therefore, they are taught throughout by **Verdyck** and **Tainer et al.**

10.5 As per Claim 19, **Verdyck** teaches a control unit for use with a thermal printer for printing an image onto a thermographic material (Page 1, Para 0010, L1-8), the thermal printer having a thermal head incorporating a plurality of energisabe heater elements (Abstract, L1-4; Page 2, Para 0017, L1-6),

the control unit being adapted to control the driving of the thermal printer so as to make a reference printout on the thermographic material, the reference printout consisting of several printed regions, the driving of the thermal printer being such that each of the several printed

regions is printed with a different constant amount of heat energy delivered to the heater elements (Page 2, Para 0023; Page 4, Para 0084; Page 4, Para 0099; Page 5, Para 0110; Page 7, Para 0139),

the control unit furthermore being adapted to determine a measure of the graphical output for each of the several printed regions measured in a zone of each region where the graphical output was printed in a thermal state (Page 2, Para 0023; Page 5, Para 0117-Para 0123), and

the control unit furthermore being adapted to establish a mathematical model of thermal printing characteristics by determining a best fit relationship between the measures of the graphical output and the constant amounts of heat energy (Page 4, Para 0084; Page 5, Para 0110; Page 2, Para 0017).

Verdyck does not expressly teach control unit furthermore being adapted to establish a mathematical model of thermal steady state printing characteristics by determining a best fit relationship between the measures of the graphical output and the constant amounts of heat energy. **Tainer et al.** teaches control unit furthermore being adapted to establish a mathematical model of thermal steady state printing characteristics by determining a best fit relationship between the measures of the graphical output and the constant amounts of heat energy (Page 1, Para 0012, L1-3; Page 18, Para 0176).

Per Claim 20: **Verdyck** and **Tainer et al.** teach the control unit according to claim 19. **Verdyck** teaches the control unit furthermore being adapted for determining a heat energy to be

supplied to at least one energisable heater element in accordance with the mathematical model (Page 5, Para 0117 to Para 0123).

Per Claim 21: **Verdyck** and **Tainer et al.** teach the control unit according to claim 19. **Verdyck** teaches thermal print head provided with a control unit (Abstract, L1-4; Page 2, Para 0017, L1-6).

Per Claim 22: **Verdyck** and **Tainer et al.** teach the method according to claim 1. **Verdyck** teaches computer program product for executing the method as claimed in claim 1 when executed on a computing device associated with a thermal print head (Abstract, L1-14).

Per Claim 23: **Verdyck** and **Tainer et al.** teach the computer program product of claim 22. **Verdyck** teaches a machine readable data storage device storing the computer program product (Abstract, L1-14).

Allowable Subject Matter

11. Claims 8 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez, can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu
Art Unit 2123
February 17, 2007